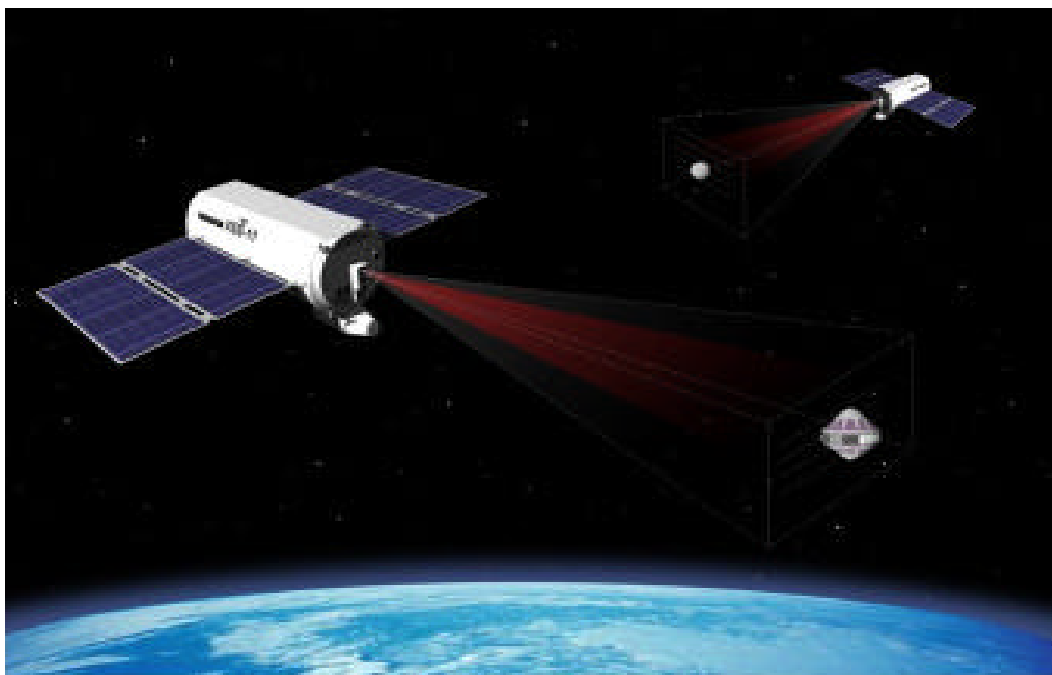


Fact Sheet

| | |
|---|--|
| Subsystem: Autonomous Rendezvous (A7) | POC Name/Org: Dr. Raman K. Mehra Scientific Systems Company, Inc. POC E-mail: rkm@ssci.com |
| Technology Name and Supporting UPN or other funding source: Name: Flight Validation of Autonomous Rendezvous in Low Earth Orbit | URLs for additional information: http://www.ssci.com http://mars.jpl.nasa.gov/ http://www.vs.afrl.af.mil/Factsheets/XSS11.html |



Description of Technology: Scientific Systems Company (SSC), in partnership with NASA-JPL, and the Air Force Research Laboratory (AFRL), will implement and flight validate an onboard, high-precision Autonomous Rendezvous (AR) system. It will be flight-tested on the AFRL XSS-11 Microsat, scheduled for launch during 2004. XSS-11 is an AFRL program to demonstrate autonomous satellite rendezvous and co-orbital operations. JPL Mars Program, jointly with the ST6 AR team, will provide the Laser Radar Sensor (LIDAR). AFRL will flight-test the LIDAR sensor and integrated AR system during its 12-month mission lifetime.

Applicability: Autonomous rendezvous technology will significantly enhance in-space rendezvous operations, and is critical for the success of several planned NASA missions such as Mars Sample Return.

Benefits to Space Science Missions: An end-to-end demonstration of an Autonomous Rendezvous system greatly benefits future space missions by reducing and retiring a number of risks inherently present in proximity operations. Particular missions that would benefit in the near- and mid-term include the planned Mars orbit rendezvous demonstration (joint mission with the French Space Agency CNES Mars Orbiter, 2007) and the NASA Mars Sample Return missions (2011, 2013). Additionally, AR technology will enable in-space inspection, servicing and refueling of satellites in Earth-orbit applications.

Development Status and Plans for Flight Readiness

| Description | Technology Maturity | Date (to be) completed |
|--|---------------------|----------------------------|
| AR system – GNC & Executive algorithms, Abort guidance | TRL 4 | AR Flight Software – 12/03 |
| LIDAR sensor – breadboard unit, laboratory and field tests | TRL 4 | Engineering Model – 9/03 |